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ACQUISITION RENAISSANCE: THE BIRTH OF CRITICAL

ANALYSIS IN THE ACQUISITION WORKFORCE

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In his article, ?The Military-Technical Revolution: A Preliminary Assessment,? Andrew F. Krepinevich, Jr. suggests ?an adaptive, flexible, and innovative acquisition system will become increasingly important as the rate of technological change increases.?1 Indeed, how can we make systems acquisition more efficient and effective? The current acquisition reform effort is an excellent beginning to addressing the issue. However, more must be done to hone the skills of the acquisition workforce to meet the challenge of implementing acquisition reform successfully. One can employ two tools from the study of military history and theory to meet this requirement. First, one could adapt the Doctrine-Strategy Relationship Model to clarify the relationships between the myriad of acquisition reform initiatives, resulting acquisition policy, requirements generation process, and budget process. A second tool, Carl von Clausewitz?s critical analysis, provides the mechanism to thoroughly evaluate the implementation of acquisition reform and to determine the applicability of lessons learned from recent acquisition experiences to future acquisition programs. Together these tools are important in improving acquisition program execution. Ultimately we will challenge the acquisition workforce to educate themselves using these tools in the planning of, during, and following an acquisition program. This emphasis on individual development and education indeed makes this an acquisition program. This emphasis on individual development and education indeed makes this an age of acquisition renaissance.

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Preface

When undertaking a complex subject like systems acquisition I feel it is imperative to establish creditability. I have 12 years of broad experience in acquisition, including laboratory, test, program office, and headquarters assignments. Most recently, I was heavily involved in the acquisition reform effort. I was the systems engineering focal point to the Air Force Acquisition Model (AFAM) program office; the DOD Systems Engineering Functional Board that reviews Acquisition Professional Development Program courses; the Air Force's Lightning Bolt #9 Integrated Product Team (IPT) for Education and Training; and the Training Subpanel, Joint Aeronautical Commanders' Group IPT (formerly Non-Government Standards IPT). I was also the Air Force's representative on the DOD Risk Management Steering Group. The thesis of this paper stems from this rare opportunity to be a part of this historic change. I certainly benefited from good timing, but above all I must acknowledge those who afforded me the chance.

I thank Colonel Louis E. Mitchell, Jr. and Mr. Lavern J. Menker for the trust and responsibility vested in me. I also appreciate the excellent guidance from Major John Corneil. As an acquisition specialist he provided an unbiased perspective and numerous positive insights throughout the effort. Finally, I wish to thank my wife for her endless support and patience during the past 3 years; and my daughters for their daily reminders that the thirst of knowledge must always be quenched.

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Abstract

In his article, "The Military-Technical Revolution: A Preliminary Assessment," Andrew F. Krepinevich, Jr. suggests "an adaptive, flexible, and innovative acquisition system will become increasingly important as the rate of technological change increases."[1] Indeed, how can we make systems acquisition more efficient and effective? The current acquisition reform effort is an excellent beginning to addressing the issue. However, more must be done to hone the skills of the acquisition workforce to meet the challenge of implementing acquisition reform successfully. One can employ two tools from the study of military history and theory to meet this requirement. First, one could adapt the Doctrine-Strategy Relationship Model to clarify the relationships between the myriad of acquisition reform initiatives, resulting acquisition policy, requirements generation process, and budget process. A second tool, Carl von Clausewitz's critical analysis, provides the mechanism to thoroughly evaluate the implementation of acquisition reform and to determine the applicability of lessons learned from recent acquisition experiences to future acquisition programs. Together these tools are important in improving acquisition program execution. Ultimately we will challenge the acquisition workforce to educate themselves using these tools in the planning of, during, and following an acquisition program. This emphasis on individual development and education indeed makes this an age of acquisition renaissance.

Notes

[1]Andrew F. Krepinevich, Jr., "The Military-Technical Revolution: A Preliminary Assessment," in War Theory, ed. Dr. Richard R. Muller et al. (Maxwell AFB, Ala.: Air Command and Staff College, Academic Year 1997), 71.

Chapter 1

Introduction

We can no longer afford to fight a bureaucratic and rule driven system--we must be able to take advantage of the professionals we have in the acquisition work force and allow them to exercise their judgment in making sound business decisions on behalf of the U. S. Government.[1]

—Mrs. Colleen A. Preston
Deputy Under Secretary of Defense for Acquisition Reform

Andrew F. Krepinevich, Jr. suggests "an adaptive, flexible, and innovative acquisition system will become increasingly important as the rate of technological change increases."[2] Today's acquisition reform initiatives have indeed heralded a transition to a more robust acquisition system. The next chapter will introduce some of the key initiatives and summarize the results to date that indicate these reforms are showing clear signs of reducing costs and increasing responsiveness. These reforms in themselves are not sufficient. Successful implementation requires the exercise of sound judgment by the acquisition work force throughout a program's life cycle. We can improve an individual's judgment by focusing on individual professional development, which makes acquisition reform really an "acquisition renaissance."

The historian Jakob Burckhardt referred to the Renaissance as a period of "a high degree of *individual development*" (emphasis added).[3] Likewise the Random House College Dictionary defines a *Renaissance man* as "a person of broad intellectual...

...interests encompassing the *full spectrum of available knowledge..."* (emphasis added).[4] These definitions apply to today's acquisition environment because current acquisition policy is more flexible, enabling *individuals* to formulate acquisition strategies and execute programs relying on *one's own expertise and experience*.

Naturally, this reliance places a greater importance on the education and training of the acquisition workforce even beyond the requirements set by the Defense Acquisition Workforce Improvement Act. The added responsibility falls on both the acquisition leadership and each individual. The DOD and the Air Force have fully recognized the responsibility. DOD has been working with the Defense Acquisition University (DAU) to update all the professional acquisition courses offered by the DAU consortium of schools. In addition, DOD has tasked the Defense Acquisition Deskbook Joint Program Office (JPO) to develop a "computerized reference set of useful information for the acquisition workforce."[5] Likewise, the Air Force Materiel Command (AFMC), as the Air Force's command responsible for acquisition policy, has sponsored the Air Force Acquisition Model (AFAM) for several years. Probably the most beneficial portion of AFAM is the historical information on best practices, lessons learned, and expert wisdom that captures years of acquisition experience and expertise. Subsequently, the Deskbook office has been collocated with the AFAM program office to form a JPO. AFMC has also formed the Lightning Bolt #9 Integrated Product Team (IPT) for Education and Training. This IPT is focusing on long-term acquisition professional development programs and immediate acquisition course updates based on the acquisition reform initiatives and implementation results.

While these efforts are imperative, they are not enough to hone the skills of each individual. Individuals must work towards improving their own judgment by thoroughly analyzing the execution of past and current acquisition programs and understanding the genesis of acquisition policy. Then, acquisition program personnel must document the findings and provide this information to the Deskbook and AFAM JPO and acquisition consortium schools. Everyone must work toward documenting key program decision points that can be thoroughly analyzed to become part of the repository of best practices, lessons learned, and expert wisdom. Simply adopting a previous strategy because it worked for that program is no longer acceptable and certainly not prudent. Two tools from the study of military theory and history can make this happen, and have specific implications.

One can adapt the Doctrine-Strategy Relationship Model that is used to explain the relationships of military history, theory, planning, and execution. The adapted model, titled the Acquisition Relationship Model, is useful in understanding how the current acquisition reform initiatives, Congressional oversight, requirements generation process, and budget process shape acquisition policy and program execution. A brief overview of the Doctrine-Strategy Relationship Model and the explanation of the Acquisition Relationship Model are provided in Chapter 3. A second tool, critical analysis, was proposed by one of history's great military theorists, Carl von Clausewitz, and provides the mechanism to thoroughly evaluate past acquisition experiences in determining the applicability to future acquisition programs. The analysis tool and illustrations are in Chapter 4. The implications of using these tools are detailed in Chapter 5. Acquisition reform has long been needed, but we are only just beginning. We have a long road ahead.

Notes

[1]Brig Gen Richard Roellig, "Acquisition Reform Legislation," Acq Reform Day Page, 31 May 1996, n.p.; on-line, Internet, 4 December 1996, available from http://www.afmc.wpafb.af.mil/organizations/HQ-AFMC/DR/dri-home/internal/down_day.htm.

[2]Andrew F. Krepinevich, Jr., "The Military-Technical Revolution: A Preliminary Assessment," in War Theory, ed. Dr. Richard R. Muller et al. (Maxwell AFB, Ala.: Air Command and Staff College, Academic Year 1997), 71.

[3]Jakob Burckhardt, The Renaissance: A History of Civilization in Italy from 1304 - 1576 A. D. (New York: Simon and Schuster, 1953), 81.

[4]The Random House College Dictionary, 1975 ed., s.v. "Renaissance man."

[5]"Secretary of Defense Approves Major Restructuring of Defense Acquisition Policy Procedures," 25 March 1996, n.p.; on-line, Internet, 13 November 1996, available from http://www.acq.osd.mil/api/asm/dod5000.html.

Chapter 2

Acquisition Reform Summary

If DOD is going to be capable of responding to the demands of the next decade, there must be a carefully planned, fundamental re-engineering or re-invention of each segment of the acquisition process.[1]

—Dr. William A. Perry
Former Secretary of Defense

Acquisition reform is not a new concept; it has been a continuous process since about 1950 with the development of the systems engineering concept. Robert McNamara, former Secretary of Defense, began the emphasis on business concepts like operations research and the application of the scientific method to systems management. The 1980's was a period devoted to the recommendations of the Packard Commission. In the early 1990's the Air Force introduced the Integrated Weapon Systems Management and Integrated Product Development concepts. Recently, the Congress and DOD have added to the reform movement with such items as the Federal Acquisition Streamlining Act (FASA) of 1994 and the specifications and standards initiative, respectively; and much more has followed.[2] Today's fervor of reform is a reflection of the changing world around us. Reduced budgets, downsizing, and a changing threat have created an environment more conducive to change than at any other time in acquisition history. What follows is an attempt to provide a brief overview of why acquisition reform is necessary and the

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initiatives proposed to facilitate its implementation (further information is provided in Appendix A).

Cost of Acquisition Regulation and Oversight

5-15%
30-50%

DoD   Commercial

Source: Carnegie Commission on Science, Technology and Government, Dec 92

We Control 80% of Cost Drivers

Top 10 Cost Drivers ≈ 50% of the Problem

MIL-Q-9858A
Truth in Negotiations Act
Cost/Schedule Control System
Configuration Management Requirements
Contract Specification Requirements
DCAA/DCMAO Interface
Cost Accounting Standards
Materiel Management Accounting System
Engineering Drawings
Government Property Administration

The "Cost Premium" Due to Unique Government Requirements

Audits   MILSPECS & STDs
Unique Contracting Requirements
Business Costs

Commercial Practice   Defense Acquisition

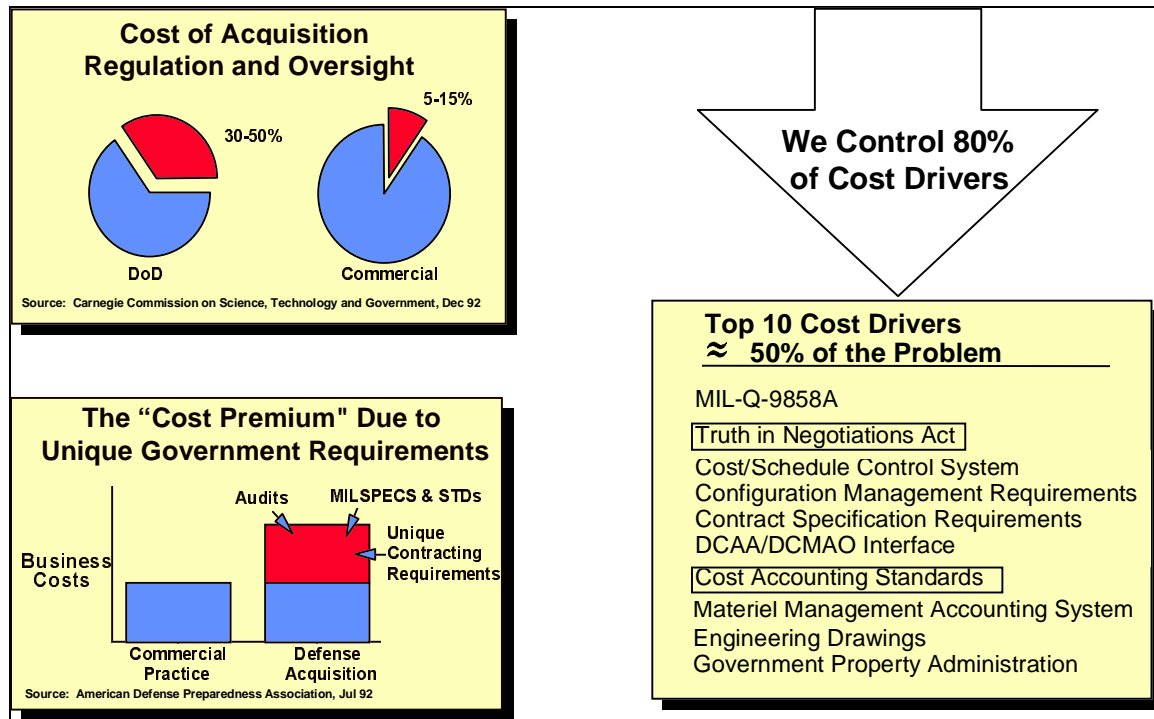Source: American Defense Preparedness Association, Jul 92

Figure 1. Cost of Doing Business

Reducing cost is one aim of acquisition reform. Three independent studies related to the cost of acquisition indicate the potential for saving exist as shown in Figure 1.[3]

A significant number of the cost drivers are in contractually required and specified processes, such as cost control and accounting systems, that companies typically already employ as a matter of sound business practices. The aforementioned specifications and standards initiative was introduced to the DOD acquisition community to "facilitate the adoption by its suppliers of business processes characteristic of world class suppliers."[4] In addition, this initiative also called for the need to "increase access to commercial state-of-the-art technology."[5] This addresses the second major aim of acquisition reform--increasing responsiveness. In today's environment, major weapon system upgrades are

the norm, and timely incorporation of the latest technology is essential to meeting warfighter needs with existing weapon systems. The bottom line is increased efficiency and effectiveness through the following objectives:[6]

1. Adopt World Class Business Practices
2. Increase Use of Commercial State-of-the-Art Technology
3. Integrate Commercial and Military Industrial Base
4. Depend on Performance Specifications and Commercial Standards
5. Streamline Processes to Reduce Cost and Cycle Time.

In March 1996 these objectives were captured as themes within the new release of the DOD 5000 series documents: DOD Directive 5000.1 and DOD 5000.2-R. These two documents are a "'visible symbol of the Department's acquisition reform efforts, which, rather than shackling employees with rigid rules and regulations, establishes a minimal set of mandatory policies and procedures and encourages members of the acquisition workforce to use their professional judgment to manage risk and tailor acquisition strategies.'"[7] These documents provide the guiding principles and mandatory procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) programs, but is applicable to all programs.[8] One must also understand clearly that the themes are interrelated, that is, they do not stand alone. The themes are:[9]

1. Teamwork
2. Tailoring
3. Empowerment
4. Cost As an Independent Variable (CAIV)
5. Commercial Products
6. Best Practices

The teamwork concept grew out of the Air Force's concepts of Integrated Weapon Systems Management, Integrated Product Development, and Integrated Product Teams. The premise of these initiatives is to bring all functional disciplines together as a team to

concurrently develop the product as well as the processes to develop, manufacture, and sustain the product. This is captured in the new 5000 documents as Integrated Product and Process Development (IPPD) and Integrated Product Teams (IPTs). IPPD along with IPTs bring cross-functional teams together at all levels of the acquisition process to maximize overall performance and optimize system design.

Before this release, a common faulty interpretation of the acquisition life cycle was that it was a rigid procedure. As shown in Figure 2, this is no longer true.[10] Tailoring is an essential tool in reducing the time it takes to meet the user's need.
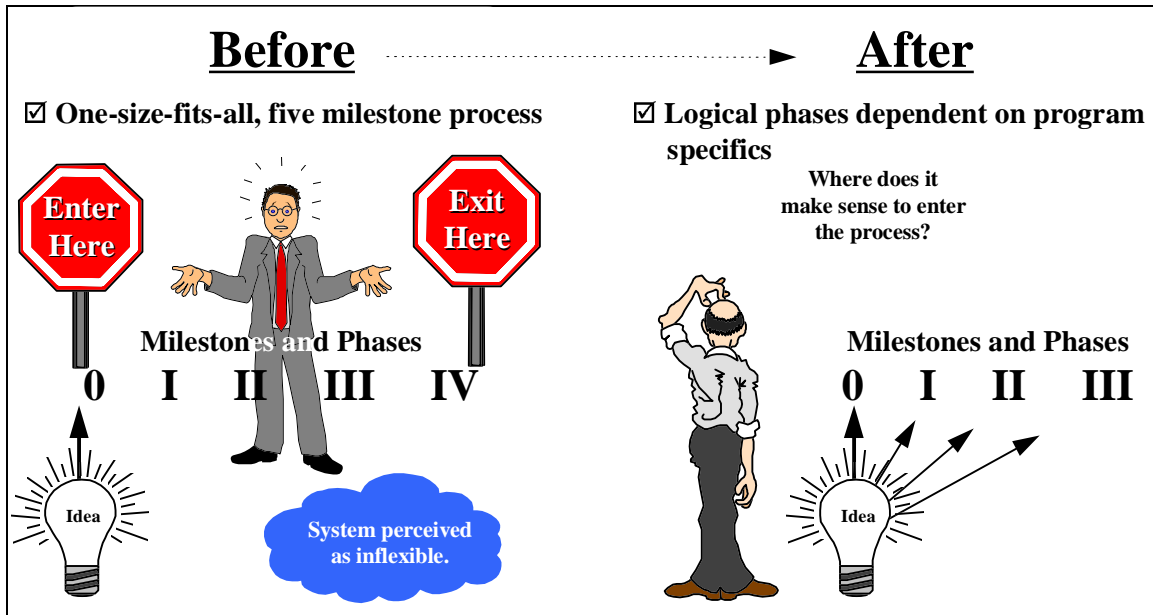

Figure 2. Milestones

Together, the Milestone Decision Authority and the program manager should consider tailoring various aspects of the acquisition process to include:[11]

1. Program documentation
2. Acquisition phases
3. Timing, scope, and level of decision reviews

Closely related to tailoring is empowerment. Under the new guidance in the DOD 5000 series, program managers may take any action permitted by law and the scope of their charter. "The new policies explicitly recognize that since each acquisition program is different, tailored management approaches are a key element in successful program execution."[12] With this recognition, a program manager now has the authority to go with the responsibility for program execution. The onus is squarely with a program manager to develop a robust acquisition strategy and conduct prudent risk management.

Any action taken by a program manager must now consider CAIV.[13] Program managers must set realistic cost objectives and stick to the cost goal. As shown in Figure 3, we have now defined a useable trade space between minimum key performance parameters and program affordability. Program managers can use this tool when making milestone decision recommendations. If we have exhausted the performance requirements trade space and we can not afford requirements creep, we must have the courage to say the program is unaffordable. To focus on this cost goal, we must include the target cost in our requests for proposals and provide incentives to potential contractors to manage cost. This places even more emphasis on assessing and managing program risk.
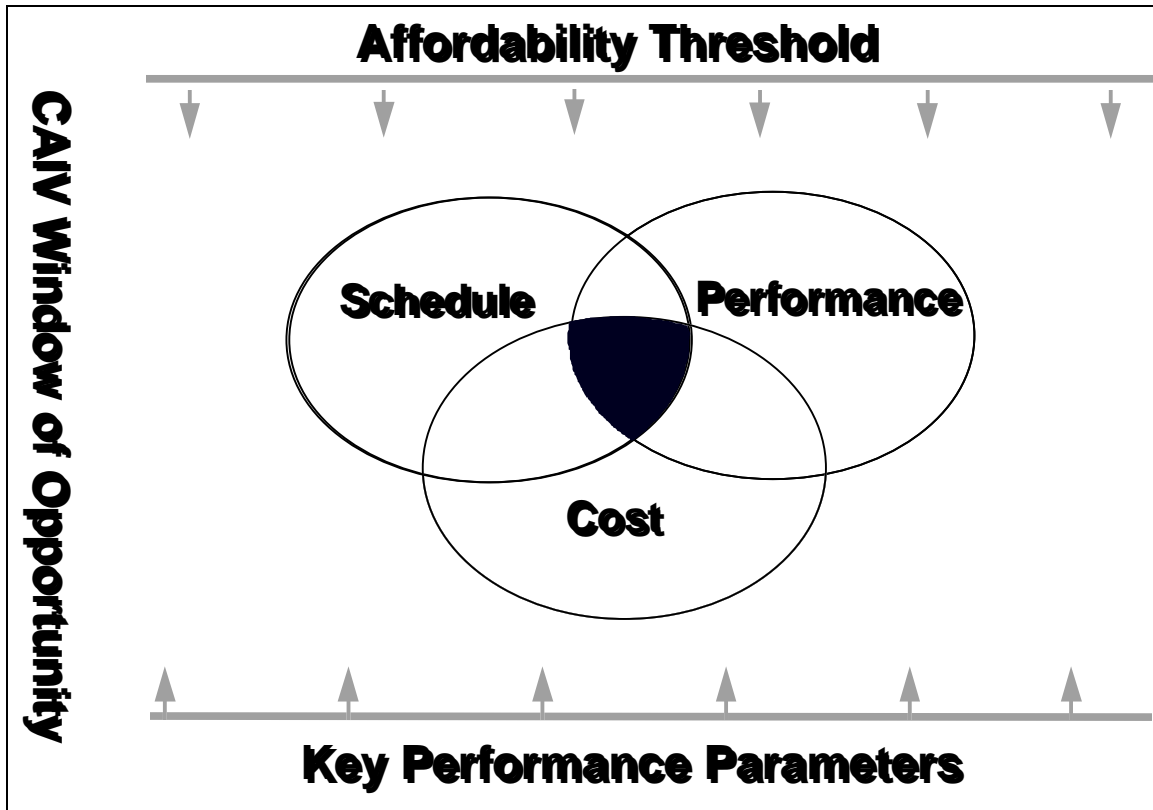
Figure 3. CAIV Trade Space

Key to the successful implementation of CAIV is reliance on commercial products and best practices—the final two themes. Again, these themes are critical to achieving cost reductions and more timely acquisitions. Several initiatives are underway that work together to implement these two themes: specifications and standards reform, open systems, single process initiative, and past performance.

The specifications and standards initiative is a key implementation effort for increasing access to state-of-the-art technology and integrating the commercial and military industrial bases. A process action team recommended "to use performance and commercial specifications and standards in lieu of military specifications and standards, unless no practical alternative exists to meet the user's needs."[14] A common misunderstanding is that all military specifications and standards were, or are in the

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process of being, rescinded upon this announcement. For example, as of June 1996, the Air Force has reduced about 5000 documents, from some 7000 to about 2000. Some military specifications and standards were updated, because certain documents, such as safety requirements and interface standards, were necessary to maintain. A waiver process exists for program managers to use a military specification and standard if prudent for their program.[15] Another misunderstanding concerns commercial standards. The government can not specify commercial standards in a request for proposal; the contractor should propose what is necessary to manage and conduct the program. The bottom line is a new view of requirements--telling the potential contractor what we want and not how to build it. In so doing, we give the contractor the maximum flexibility to "explore fully the design space of performance features versus cost."[16] We should recall that this is the focus of the CAIV initiative.

In terms of increasing access to state-of-the-art technology, a closely related initiative is open systems. Open systems is a very complex concept and justice could not be done in this brief overview. Suffice it to say, open systems is an implementation tool to design robust systems that are capable of rapid incorporation of changing technology.[17]

Focusing on the cost drivers shown above, the single process concept aims to reduce costs by adopting a single process for various functions at a commercial facility.[18] For example, in the past a contractor may have had several cost accounting systems that basically serve the same function. Each system was based on the unique requirements for the contractor's own internal use and those of each military service conducting business at that facility. Thus, the contractor might have four cost accounting systems, and the government probably is absorbing the cost of this redundancy. The single process concept

allows contractors, working with the local DOD program managers, to submit proposals for adopting one process within a facility. As of June 1996, contractors have submitted over 100 concept papers affecting nearly 200 processes, and about 35 modified processes were adopted.

Obviously these initiatives have significantly reduced the oversight of contractors. What we need now is insight into the contractor's processes and products—a measuring stick to ensure we are doing business with a "world class supplier." Thus, past performance has a renewed emphasis today.[19] The services are working together to capture past performance data and establish a common process.

In addition, the DOD has established several lead and pilot programs, as listed in Table 1, to learn how to successfully implement these initiatives.[20]

Table 1. Acquisition Reform Lead / Pilot Programs

Lead Programs	Pilot Programs
Evolved Expendable Launch Vehicle (EELV)	Commercial Derivative Engine (CDE) (C-17 Engine)
Ground Theater Air Communications System (GTACS)	Joint Direct Attack Munition (JDAM)
Space Based Infrared Systems (SBIRS)	Commercial Derivative Aircraft (CDA) (Non-Developmental Airlift Aircraft (NDAA))
Wind Corrected Munitions Dispenser (WCMD)	Joint Primary Aircraft Training System (JPATS)

Many other initiatives exist (see Appendix A for a listing) that focus on financial, cycle time, policy, contracting, and training reform. The intent is to highlight those that have the greatest impact on the way we have conducted acquisition programs in the past. What has this impact been? Has acquisition reform implementation resulted in any significant cost or time reductions? Table 1 indicates that it is working.[21] However, two

tools can help us to better understand the relationships between the initiatives and evaluate

whether these savings truly are a result of successful acquisition reform implementation.

Table 2. Implementation Results

Program (Service)	Cost Savings	Development Time "Saved"
JDAM (Air Force)	50% (unit cost)	34%
FSCATT (Army)	34%	33%
JPATS (USAF / USN)	n/a	12%
C-17 (Air Force)	25% (projected)	n/a

Notes

[1]"Building A Lean, Agile Acquisition System: Acquisition Reform Trims Modernization Bill By $13 Billion," *Air Force Acquisition Reform*, March 1996, 5; on-line, Internet, 22 January 1997, available from http://www.safaq.hq.af.mil/acq_ref/library.html.

[2]Mr. Glenn Miller, "Acquisition Reform," n.p.; on-line, Internet, 4 December 1996, available from http://www.afmc.wpafb.af.mil/organizations/HQ-AFMC/DR/dri-home/internal/briefs.htm.

[3]Miller.

[4]William Perry, Office of Secretary of Defense, memorandum for Secretaries of the Military Departments, Chairman of the Joint Chiefs of Staff, Under Secretaries of Defense, Comptroller, Assistant Secretary of Defense (Command, Control, Communications, and Intelligence), General Counsel, Inspector General, Director of Operational Test and Evaluation, Directors of the Defense Agencies, Commander-in-Chief, U.S. Special Operations Command, subject: Specifications & Standards - A New of Doing Business, 29 June 1994.

[5]Perry.

[6]Gen Henry Viccellio, Jr., "Acquisition Reform...Focus On The Future," n.p.; on-line, Internet, 4 December 1996, available from http://www.afmc.wpafb.af.mil/organizations/HQ-AFMC/DR/dri-home/internal/down_day.htm.

[7]Quoted in "Secretary of Defense Approves Major Restructuring of Defense Acquisition Policy Procedures," 25 March 1996, n.p.; on-line, Internet, 13 November 1996, available from http://www.acq.osd.mil/api/asm/dod5000.html.

[8]Department of Defense Directive (DODD) 5000.1, Defense Acquisition, 15 March 1996, 2.

[9]Paul Kaminski, Under Secretary of Defense (Acquisition & Technology); Philip Coyle, Director, Operational Test and Evaluation; Emmett Paige, Jr., Assistant Secretary of Defense (Command, Control, Communications & Intelligence), memorandum for the Defense Acquisition Community, subject: Update of the DOD 5000 Documents, 15 March 1996.

Notes

[10]"DOD 5000," n.p.; on-line, Internet, 4 December 1996, available from http://www.afmc.wpafb.af.mil/organizations/HQ-AFMC/DR/dri-home/internal/down_day.htm.

[11]Paul Kaminski, Under Secretary of Defense (Acquisition & Technology); Philip Coyle, Director, Operational Test and Evaluation; Emmett Paige, Jr., Assistant Secretary of Defense (Command, Control, Communications & Intelligence), memorandum for the Defense Acquisition Community, subject: Update of the DOD 5000 Documents, 15 March 1996.

[12]"Secretary of Defense Approves Major Restructuring of Defense Acquisition Policy Procedures," 25 March 1996, n.p.; on-line, Internet, 13 November 1996, available from http://www.acq.osd.mil/api/asm/dod5000.html.

[13]Noel Longuemare, "Cost As an Independent Variable," n.p.; on-line, Internet, 4 December 1996, available from http://www.afmc.wpafb.af.mil/organizations/HQ-AFMC/DR/dri-home/internal/down_day.htm.

[14]William Perry, Office of Secretary of Defense, memorandum for Secretaries of the Military Departments, Chairman of the Joint Chiefs of Staff, Under Secretaries of Defense, Comptroller, Assistant Secretary of Defense (Command, Control, Communications, and Intelligence), General Counsel, Inspector General, Director of Operational Test and Evaluation, Directors of the Defense Agencies, Commander-in-Chief, U.S. Special Operations Command, subject: Specifications & Standards - A New of Doing Business, 29 June 1994.

[15]Perry.

[16]Noel Longuemare, "Cost As an Independent Variable," n.p.; on-line, Internet, 4 December 1996, available from http://www.afmc.wpafb.af.mil/organizations/HQ-AFMC/DR/dri-home/internal/down_day.htm.

[17]Briefing, Single Managers Conference, subject: Open Systems Architecture for Weapon Systems, 6 November 1996.

[18]"DOD Single Process Initiative," n.p.; on-line, Internet, 4 December 1996, available from http://www.afmc.wpafb.af.mil/organizations/HQ-AFMC/DR/dri-home/internal/down_day.htm.

[19]Brig Gen Richard Roellig, "Acquisition Reform Legislation," Acq Reform Day Page, 31 May 1996, n.p.; on-line, Internet, 4 December 1996, available from http://www.afmc.wpafb.af.mil/organizations/HQ-AFMC/DR/dri-home/internal/down_day.htm.

[20]"Acquisition Reform Initiatives," 26 November 1996, n.p.; on-line, Internet, 21 January 1997, available from http://www.afmc.wpafb.af.mil/organizations/HQ-AFMC/DR/dri-home/internal/down_day.htm.

[21]Dr. Paul G. Kaminski, "The Defense Acquisition System--A New Direction; A New Emphasis," address to the Advanced Planning Briefing to Industry, U.S. Special Operations Command, Tampa, Fl., 3 April 1996.

Chapter 3

Model Development

We disregard the lessons of history.[1]

—George S. Patton, Jr.

Within the Air Force, a series of briefings (Roadshow I) were scheduled to inform the acquisition community of the mandate for change and highlights of acquisition reform. Unfortunately, the trip was canceled prematurely, and consequently some misunderstanding of the rationale for acquisition reform still prevails today. A model from the study of military theory can help illustrate that acquisition reform is indeed a carefully planned change based on theory, experience, and the strategic environment.

The Doctrine-Strategy Relationship Model is a tool developed for use in analyzing military historical events.[2] As depicted in Figure 4, the four parts are: Inputs, Doctrine, Strategy, and Results.
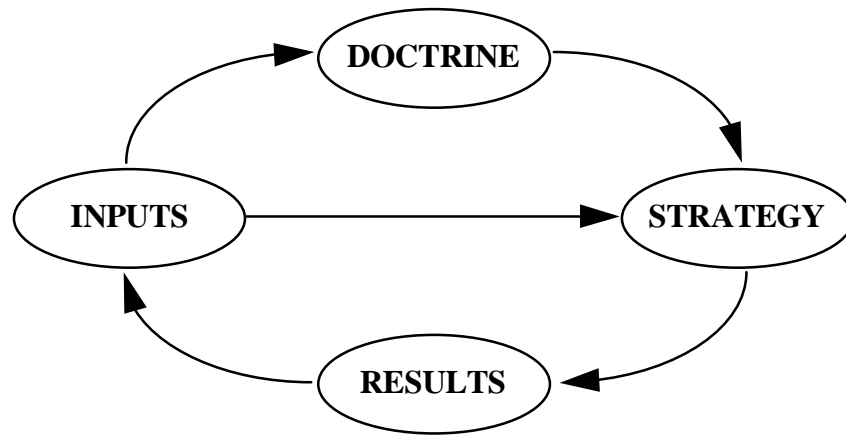
Figure 4. Doctrine-Strategy Relationship Model

Inputs take the form of various contextual elements that influence and constrain the development of doctrine and the formulation of strategy employed for actual operations. These contextual elements typically include such items as national security objectives; politics, both national and international; economics, such as budgets; technology; the threat; and military theory and history. Doctrine, as defined in Drew and Snow's *Making Strategy,* is "what we believe about the best way to do things."[3] The key point is that doctrine is not directive, it is prescriptive. The doctrine is the guide commanders use when formulating strategy. Strategy, more specifically military strategy, is best defined by Drew and Snow as, "The art and science of coordinating the development, deployment, and employment of military forces to achieve national objectives."[4] This is the means to obtain the end. Results bring the model full circle. These results are recorded as military history, and serve as the wealth of experience one can draw from as input into new doctrine development or operational strategy formulation.

Thus, since acquisition policy is also based on experience and theory, this model might be applied to systems acquisition as shown in Figure 5. The adapted model is titled the Acquisition Relationship Model and has five parts. Three of the parts correlate one-

for-one with three parts of the Doctrine-Strategy Relationship Model. First, the DoD 5000 series can certainly be viewed as the doctrine for acquisition. As stated above, the DoD 5000 series contains the guiding principles for acquisition. It is also "what we believe about the best ways to do things"--namely systems acquisition. Secondly, acquisition strategy, like military strategy, is the program manager's plan for executing a program within the means available, including specific cost, schedule, and performance objectives. Hopefully, if all goes well, the final result is a system or product that meets the user's needs within cost and schedule goals.
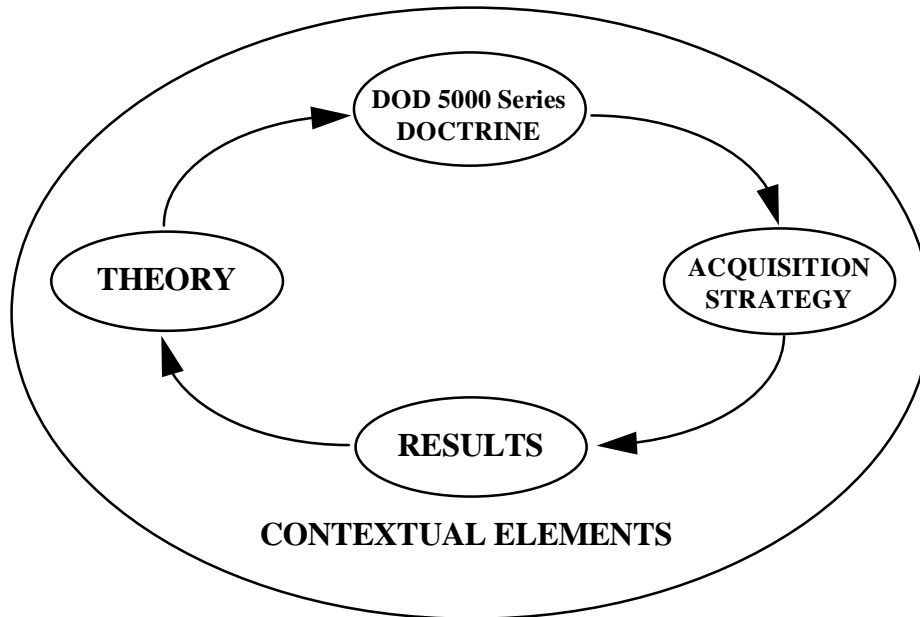

Figure 5. Acquisition Relationship Model

However, the Acquisition Relationship Model has one significant difference from the Doctrine-Strategy Relationship Model. Input is separated into two parts to emphasize the influence of the contextual elements on the *entire* model. Before addressing this influence, the loop should be completed by looking at theory.

Similar to military theory, acquisition theory is developed based on the results of past programs. For example, one such theory is Integrated Product and Process Development (IPPD) and its associated tool, systems engineering. As mentioned earlier, IPPD and systems engineering are about the concurrent development of processes along with the product. In the commercial world, the Boeing 777 program team set the standard for successful integrated product and process development. On the other hand, a commonly cited example of a problem acquisition is the F-4 radio battery. The battery had a very short life, and needed replacement often. However, the replacement was time-consuming and hazardous because the battery was under the pilot's seat. Replacement required the explosive ordnance team to first remove the ejection seat. Clearly this program had not considered maintenance requirements early on in the life cycle. Under the IPPD concept, the maintainers would be active participants in the requirements process early on to identify inherent maintenance requirements.

The formal requirements generation process is one of the factors included in the final part of the Acquisition Relationship Model—the contextual elements. These elements also include the Program, Planning, and Budgeting System (PPBS); Congressional oversight; Joint Requirements Oversight Council (JROC); and the strategic environment. The environment includes threat changes, joint warfighting emphasis, and the overall domestic climate. Again, contextual elements were broken out separately because they have a significant impact on each of the other four parts of the model. Thus, looking at Figure 2, the contextual elements completely surround the loop.

As mentioned earlier, the current environment of reduced budgets and subsequent emphasis on the modernization of existing systems clearly called for a change in how we

acquire systems. This impacts the model from both a theory and doctrine perspective. For years now, many have proposed the use of modeling and simulation to reduce the cost of verifying and validating a system's performance. Yet, it was not until the environment changed that the new DOD 5000 series advocated the use of modeling and simulation.[5] In fact, it calls for considering the use of modeling and simulation throughout the acquisition life-cycle from requirements generation to logistics support.

Congressional oversight can effect the program manager's acquisition strategy in at least two ways. Increased interest in a program not normally qualifying as a MDAP might up the milestone review level, and potentially cause delays while preparing for Selected Acquisition Reports or the Cost Analysis Improvement Group. Since Congress is the key player in the budget process, a program manager's acquisition strategy must change when the final authorization and appropriation bills differ from the program objective memorandum (POM) that the program manager used to set his or her current acquisition strategy.

Congress is not the only interested party. The Chairman of the Joint Chiefs of Staff (CJCS) has a statutory responsibility to advise the President and Secretary of Defense on the validity of requirements.[6] The JROC was formed to assist the CJCS in fulfilling this obligation. The primary goal of the JROC is to ensure the warfighting needs of the combatant CINCs are met—the joint perspective. Again, the JROC may review any program regardless of acquisition category. Certainly, unplanned changes to the program can result. However, the JROC process has been reformed, resulting in a true corporate-level review. Together with the commitment by Congress to acquisition reform, program manager's can expect constructive criticism versus micro-management.

Finally, contextual elements have an obvious influence on results. However, of import is the fact that one's analysis of a program's results must consider these contextual elements. This fact cannot be overstated because to ignore the contextual elements can lead to faulty conclusions. Clausewitz recognized this distinction when he emphasized that the most significant use of historical examples is to develop proof that something is the best way, and thus should become doctrine.[7] The four uses are:

1. Explanation of an idea
2. Application of an idea
3. Support of an idea
4. Proof of the merit in an idea.

The Acquisition Relationship Model helps one to explain the genesis of acquisition reform initiatives and their interrelationships. With this understanding the model can aid in gaining widespread acceptance of new theories and doctrine. However, proof requires more detailed information and a chronology of major events such as key decision points. The model sets the proper magnification on the microscope so that one can clearly understand the events and results in the proper context. Another tool is still needed to help sift through the multitude of information available in a well-documented program.

Notes

[1]Charles M. Province, The Unknown Patton (New York: Bonanza Books, 1984), 158.
[2]"The Doctrine-Strategy Relationship Model," in Air Command and Staff College Seminar/Correspondence Lesson Book, vol. 3, lesson 9, ed. Maj Thomas J. Stark, et al. (Maxwell AFB, Ala.: Air Command and Staff College Associate Programs, Academic Year 1993), 9-79 to 9-82.
[3]Col Dennis M. Drew and Dr. Donald M. Snow, Making Strategy: An Introduction to National Security Processes and Problems (Maxwell Air Force Base, Alabama: Air University Press, 1988), 163.
[4]Drew and Snow, 18.

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[5]Department of Defense Regulation 5000.2-R, Mandatory Procedures for Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs, 15 March 1996, Part 3, 17.

[6]"JROC: Planning in a Revolutionary Era," in Joint Operations and Campaign Concepts, vol. 7, ed. Maj Randall Horn et al. (Maxwell AFB, Ala.: Air Command and Staff College, Academic Year 1997), 76-88.

[7]Carl von Clausewitz, On War,. ed. and trans. by Michael Howard and Peter Paret (Princeton, N. J.: Princeton University Press, 1976), 171.

Chapter 4

Critical Analysis

The influence of theoretical truths on practical life is always exerted more through critical analysis than through doctrine.[1]

—Carl von Clausewitz

The Acquisition Relationship Model is an excellent tool to facilitate understanding of how theory becomes doctrine, but it does little to foster individual development. Given limited resources and focus on modernization programs, there will be few chances to work on major acquisition programs. So individuals will need a means to improve judgment despite these limited opportunities at actual experience. The great military theorist Carl von Clausewitz recognized a similar shortcoming for military commanders. Clausewitz proposed a process called critical analysis, and the most important attribute of the process is the improvement of judgment. "Clausewitz believed that the role of critical analysis-- and for that matter, the role of theory itself—was to hone the commander's judgment."[2]

Critical analysis has three steps.[3] The first step is to record the relevant facts from the historical record—the what. Next, effects are traced back to causes. This is the heart of critical analysis—determining why. Finally, the means employed are evaluated for any lessons. In the final step, individual ability is essential to investigate not only the means used, but all possible means that could have been used. One must also determine how the proposed alternative would affect the outcome. Indeed, one is asking if this is a better

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alternative? As before, this analysis must be conducted in the proper context. The alternatives proposed must be appropriate given that moment in history. Improved knowledge is the result of finding a better alternative. The tool has been used extensively in the study of military history and theory with positive results. The question is whether critical analysis can be applied to systems acquisition, particularly focusing on better decision making.

The Challenger Case Study conducted by Colonel Hutchinson, USA, and Captain Slovacek, USN, answer this affirmatively.[4] In this case study, the authors analyze the fateful decision to launch the Challenger despite all indications to the contrary. The focus of this study is on the role of values and ethics in decision making. Given that values and ethics are judgmental factors, this case should certainly demonstrate that critical analysis can apply to improving judgment in making acquisition decisions.

Although the authors do not specifically present their study in Clausewitz's critical analysis format, all the essential ingredients are there. First, the authors establish the relevant facts, such as NASA's mission, organizational structure, and the history of NASA's three space flight centers. Next, they begin to look at causes and effects to include: the leadership structure, budget issues, and scheduling pressures. A clear example of exploring cause and effect is illustrated thusly: "Another impact of budget reductions was to reduce the Marshall Center's ability to do the kind of testing that might have identified the O-ring failure problem." Moreover, throughout their analysis, the authors demonstrate the influence of politics—a contextual element—on decision making.

The authors illustrate the requirement to investigate every alternative by even looking at the solid rocket motor source selection as far back as the early 1970s. The NASA

administrator selected Thiokol Chemical Corporation of Utah as the solid rocket booster manufacturer even though the source selection board had recommended Lockheed of California. On the surface it is not unusual for a source selection authority to award counter to the board's recommendation. However, in this case the authors relate key facts that suggest of political undertones. The NASA administrator was a former president of the University of Utah and his wife's hometown housed a major Thiokol division. One Utah senator was chairman of the Senate committee overseeing NASA's budget. The other Utah senator was a close friend of the administrator, and his daughter was married to the administrator's brother. Although the contract award may have been on the "up and up," one should never overlook any alternative nor the influence of politics on decision making.

Politics also continued to exasperate the budget issues and mounting schedule pressures preceding the Challenger launch. NASA felt constant pressure from Congress and customers over the cost of shuttle operations. Reducing cost per launch required an operational launch tempo of 24 launches per year. Yet, the Columbia launch just prior to the Challenger had already had three slips and four postponements. The Challenger also required parts from the Columbia, which compounded the launch scheduling problems. Consequently, despite the engineering leadership's recommendations for launch delay, management leadership pressed for launch. The authors analyze several other factors to come up with the *why*. The better alternative in this example is clear—delay the launch.

However, if we can get a firm grasp of the influence of contextual elements, one must remember a couple of points. One, they may indicate that no other alternatives were available to the decision maker. They may also indicate that the program being analyzed

has no application to a current situation because the contextual elements are substantially different. Nonetheless, the contextual elements are the essentials to understanding complex programmatic results.

There are other benefits besides the development of case studies like the Challenger example. The process can be used to formulate best practices, lessons learned, and expert wisdom for documentation in Deskbook and AFAM. Since we are after better means, the process can also create and validate new theories.[5] On the other hand, the tool is fully dependent on thorough documentation. One may have to substitute assumptions where facts are missing. This can be particularly limiting if essential information concerning the strategic environment (i.e., the contextual elements) is missing, such as political influences. Furthermore, since the process is about improving knowledge, lack of knowledge or experience can make it difficult to link causes to effects. Ultimately these can result in meaningless or incorrect conclusions.

The bottom line is that the proper application of both critical analysis and the Acquisition Relationship Model will result in very meaningful products. The key that unlocks the door is the fact that the model is timeless. The contextual elements are the essential factors that can process the dynamic, ever-changing nature of systems acquisition; however, if and only if, these factors are thoroughly documented.

Notes

[1]Carl von Clausewitz, On War, ed. and trans. by Michael Howard and Peter Paret (Princeton, N. J.: Princeton University Press, 1976), 156.

[2]Dr. Richard Muller, "MT-502 The Classical Theorists & Their Influence, Article on Clausewitz," *War Theory*, ACSC Distance Learning Multimedia Edition, Version 1.1, CD-ROM, Air Command and Staff College/DTD, January 1996.

[3]Carl von Clausewitz, On War, ed. and trans. by Michael Howard and Peter Paret (Princeton, N. J.: Princeton University Press, 1976), 156.

Notes

[4]"CL-504 Values, Ethics & Actions, Article on Challenger Case Study," *Command and Leadership*, ACSC Distance Learning Multimedia Edition, Version 1.1, CD-ROM, Air Command and Staff College/DTD, January 1996.

[5]"MT-502 The Classical Theorists & Their Influence, Questions & Answers," *War Theory*, ACSC Distance Learning Multimedia Edition, Version 1.1, CD-ROM, Air Command and Staff College/DTD, January 1996.

Chapter 5

Implications

The strategic focus of the defense acquisition and technology program is on fielding superior operational capability and reducing weapon system life cycle costs.[1]

—Dr. Paul G. Kaminski
Under Secretary of Defense for Acquisition and Technology

The issue of affordability has demanded a significant change in how we acquire weapon systems. This change has placed a premium on individual development of acquisition personnel. Yet, the opportunity to work on the most challenging of programs and gain the valuable experience needed has diminished. Likewise, reduced budgets and smaller program office staffing will make it equally difficult to get the formal training required. Individuals must work on their own towards improving their judgment by thoroughly understanding current acquisition policy and evaluating the execution of acquisition programs for lessons learned. The two tools, the Acquisition Relationship Model and critical analysis, will support this effort.

These tools do require detailed program information. Clearly, program office personnel must improve on the thorough documentation of essential program information such as key decision points, financial data, formal documents and directives, and any Congressional interest shown. This data must then be captured for future analysis. Deskbook and AFAM are logical choices as repositories. However, a process is needed

to institutionalize data capture; subsequent analysis for best practices, lessons learned, and expert wisdom; and incorporation into Deskbook, AFAM, and acquisition courses. Headquarters AFMC should take the lead in establishing a formal mechanism for key program office personnel to attend a "program execution documentation" course on standard documentation practices. These program office personnel must then be tasked to provide the products to AFAM that will benefit its customers--the acquisition workforce.

A second consideration is for program offices or the Deskbook/AFAM JPO to sponsor future ACSC research projects. Using the tools proposed here, researchers could focus on an on-going program to test the validity of using critical analysis on acquisition programs. In the near term, the lead or pilot programs are excellent choices to test the thesis. A positive result would have the added benefit of validating the documentation process to build-up the most important aspect of Deskbook and AFAM—best practices, lessons learned, and expert wisdom.

This area of both computer reference sources is woefully lacking. Deskbook is in its infancy (first release was in July 1996). Although AFAM has been around much longer, the best practices, lessons learned, and expert wisdom section is lacking in both quantity and quality of material. Some advice is grossly simplified to suggest, "do it this way because it worked for us." Using the Acquisition Reference Model would ensure accounting for the ever changing contextual elements. Program offices must recognize the potential benefits of Deskbook and AFAM as learning tools, and work with the JPO to document and thoroughly analyze programs. The subsequent lessons are essential to making the sound business decisions required to acquire timely, affordable weapon systems that meet the user's need.

Notes

[1]Kaminski, Dr. Paul G., Under Secretary of Defense for Acquisition and Technology, Department of Defense. Address. United States Special Operations Command Advanced Planning Briefing to Industry, Tampa, Florida, 3 April 1996.

Chapter 6

Conclusions

This is not the end, or the beginning of the end, but it is, I believe, the end of the beginning.[1]

—Sir Winston Churchill

The current acquisition reform effort is an excellent beginning to meeting the force modernization challenges of the next century. The most important aspect of the reform is the trust and responsibility vested in the acquisition workforce; thus, more must be done to hone their business acumen. The DOD and Services have made a significant investment and effort into educating the workforce since Congress passed the DAWIA. Furthermore, DOD and the Air Force through the Lightning Bolt #9 IPT have placed a priority on updating all acquisition courses as acquisition reforms are implemented. We in acquisition need to accept our responsibility for self improvement.

One can employ two tools, the Acquisition Relationship Model and critical analysis, to meet this requirement. Together these tools are important in increasing individual knowledge and judgment; and hopefully, acquisition program execution. To ensure adequate documentation, acquisition personnel and researchers should work with the Deskbook and AFAM JPO and DAU Consortium schools to formulate and record the valuable experiences. Acquisition personnel should use these tools consistently throughout the life cycle of a program: in the planning of, during execution of, and

following termination of an acquisition program. This emphasis on individual development and education to maximize available knowledge indeed makes this the dawn of an acquisition renaissance era.

Notes

[1]Quoted by Dr. Paul G. Kaminski, "Single Process Initiative-Progress and Prospects," address to Board of Governors Meeting, Aerospace Industries Association, Williamsburg, Va., 23 May 1996.

Appendix A

Acquisition Reform Initiatives Database

At one point there existed over 100 acquisition reform initiatives. However, since the Air Force introduced the Lightning Bolts, AFMC/DRI has led an effort to eliminate duplication and overlap among the original initiatives. In addition some initiatives have been terminated upon successful implementation. The following is a current listing of acquisition reform initiatives.[1]

1) # 1 BOLT: RFP Support Team
2) # 2 BOLT: Standing Senior Acquisition Strategy Panel
3) # 3 BOLT: System Program Office Sizing
4) # 4 BOLT: Cancel All Center Level Acquisition Policies/Supplements
5) # 5 BOLT: Reinvent AFSARC Process
6) # 6 BOLT: Elevate Past Performance in Source Selection
7) # 7 BOLT: Single Acquisition Management Plan (SAMP)
8) # 8 BOLT: Acquisition Reform Metrics
9) # 9 BOLT: Acquisition Reform Training
10) # 10 BOLT: Reduce Cycle Time
11) # 11 BOLT: Streamline & Establish Common Laboratory Business Practices
15) Clear Accountability in Design (CAID) (RPM-AP-22)
16) Color of Money Initiatives
18) Contract Close-out Process Action Team (PAT)
19) Contractor Delivery Performance PAT
22) Contractor Purchasing Requirements (CPSR)
23) Contractor Total System Performance Responsibility (TSPR) (RPM-AP-6)
24) Contractual and Management Incentives
25) Cost Modeling for Selected Programs
26) Create/Apply Certification Criteria for Contractor Management Processes (RPM-AP-20)
27) Develop a Less Complex Acquisition Process (RPM-AP-1)
29) DOD Software Development MIL STD 2167A

30) Electronic Commerce/Electronic Data Interchange in Contracting (EC/EDI)

35) Increasing reliance on the Defense Contract Management Command (DCMC) for contract management oversight (RPM-AP-14)

37) Integrated Program Management Initiative (IPMI)

38) International Standards Organization (ISO) 9000 Series Quality Assurance Standards

39) Lead Program - Evolved Expendable Launch Vehicle (EELV)

40) Lead Program - Ground Theater Air Communications System (GTACS)

41) Lead Program - Space Based Infrared Systems (SBIRS)

42) Lead Program - Wind Corrected Munitions Dispenser (WCMD)

43) Lean Aircraft Initiative (LAI)

46) Military Products from Commercial Lines Pilot Program

48) Pilot Program - Commercial Derivative Engine (CDE) (C-17 Engine)

49) Pilot Programs - Joint Direct Attack Munition (JDAM)

50) Pilot Programs - Commercial Derivative Aircraft (CDA) (Non-Developmental Airlift Aircraft (NDAA))

51) Pilot Programs - Joint Primary Aircraft Training System (JPATS)

54) Reducing the number of Military Specifications and Standards and increasing the use of commercial specifications (RPM-AP-4)

58) Self-Certification Initiative

59) Single Process Initiative

60) Software Normalization: Transitioning Software Support from Operating Commands to AFMC

62) Standardize the Use of Templates in RFP and Source Selection (RPM-AP-7)

63) Supply Support IPT (SS IPT)

64) Support Equipment Process Senior IPT (SEPS IPT)

66) Truth in Negotiation Act (TINA)

Notes

[1]"Acquisition Reform Initiatives," 26 November 1996, n.p.; on-line, Internet, 21 January 1997, available from http://www.afmc.wpafb.af.mil/organizations/HQ-AFMC/DR/dri-home/internal/down_day.htm.

Glossary

ACSC	Air Command and Staff College
AFAM	Air Force Acquisition Model
AFMC	Air Force Materiel Command
AFSARC	Air Force Systems Acquisition Review Council
CAID	Clear Accountability in Design
CAIV	Cost As an Independent Variable
CDA	Commercial Derivative Aircraft
CDE	Commercial Derivative Engine
CINC	Commander in Chief
CJCS	Chairman of the Joint Chiefs of Staff
CPSR	Contractor Purchasing Requirements
DAU	Defense Acquisition University
DAWIA	Defense Acquisition Workforce Improvement Act
DCMC	Defense Contract Management Command
DoD/DOD	Department of Defense
EC	Electronic Commerce
EDI	Electronic Data Interchange
EELV	Evolved Expendable Launch Vehicle
FASA	Federal Acquisition Streamlining Act
FSCATT	Fire Support Combined Arms Tactical Trainer
GTACS	Ground Theater Air Communications System
IPMI	Integrated Program Management Initiative
IPPD	Integrated Product and Process Development
IPT	Integrated Product Team
ISO	International Standards Organization
JDAM	Joint Direct Attack Munition
JPATS	Joint Primary Aircraft Training System
JPO	Joint Program Office
JROC	Joint Requirements Oversight Council

LAI	Lean Aircraft Initiative
MAIS	Major Automated Information System
MDAP	Major Defense Acquisition Program
MIL STD	Military Standard
NDAA	Non-Developmental Airlift Aircraft
PAT	Process Action Team
POM	Program Objective Memorandum
SAMP	Single Acquisition Management Plan
SBIRS	Space Based Infrared System
SEPS IPT	Support Equipment Process Senior IPT
SS IPT	Supply Support IPT
TINA	Truth in Negotiation Act
TSPR	Total System Performance Responsibility
USA	United States Army
USN	United States Navy
WCMD	Wind Corrected Munitions Dispenser

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